

According to the Claim No 2 of DE-OS 28 13 888 a four-point seat belt for a passenger seated in the rear, defined by the shoulder and lap belt portion of a three-point seat belt and an upper shoulder belt, is made from one piece. Each belt is guided by a belt deflector, adjacent to the lower part of the body of the passenger, and fastened to the vehicle frame. The end portions of the shoulder belt portion and the upper shoulder belt are provided with belt retractors, attached to the seat backrest. In an attempt to step out the passenger has to lower the upper part of his body in order to slip underneath the upper shoulder belt which cannot be removed.

For convenience the belt deflector of the upper shoulder belt is replaced with a latch plate and a corresponding buckle assembly, fastened to the vehicle frame.

DE 196 29 878 A1 teaches a four-point seat belt, comprising two independent three-point seat belts, each having a belt retractor, latch plate, belt deflector and buckle assembly.

US 3,977,696 discloses a four-point seat belt, comprising a three-point seat belt and an upper shoulder belt, both of which, provided with belt retractors, are guided in two rails and driven by electrical motors of a heavy device. When the vehicle roof is totally deformed in a rollover-accident the heavy device crushes the passenger into death.

US 5,123,673 discloses a four-point seat belt, comprising a three-point seat belt and an upper shoulder belt, both of which are provided with belt retractors. An intricate, automatic release device facilitates the release of both buckle assemblies, each equipped with an actuator to release them, regardless of which one is manually released first. When an MB 200 crashes into the vehicle door of an MB S in the city of Geisenheim, a lateral intrusion of about 80 cm is measured. The accident report "U170199" is incorporated herein. When used, the buckle assembly, actuator and other parts, all of which face the totally deformed vehicle door, are destroyed. Hence, the other one does not function. The severely injured driver remains restrained. This rescue workers can't evacuate him within seconds.

In the NHSTA side crash test, which, currently legislated, idealizes an SUV crashing at an angle of 30° into a door or vehicle side. As a result, the buckle assembly, actuator and other parts are destroyed.

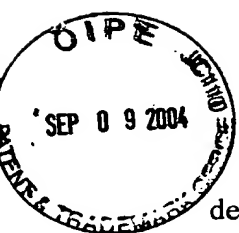
A complicated latch-plate-feeding device, installed to the side of seat cushion, moves forwards to present the latch plate of the three-point seat belt to the passenger, after having sat down. This device, facing the vehicle door totally deformed in a side crash, is destroyed.

US 5,411,319 discloses a four-point seat belt, comprising two independent three-point seat belts, having a common lap belt portion. Two end belt portions of both three-point seat belts are projected through the seat backrest and attached to a pair of belt retractors, provided with a pair of supporting pieces, which are arranged in a pair of seat rails, are retained thereby and are moveable therealong with the seat when the latter is longitudinally adjusted.

According to the above-mentioned patent docs and appls US 3,977,696, US 5,123,673, US 5,411,319, US 6,076,894, US 6,375,270 B1, DE-OS 28 13 888 and DE 196 29 878 A1 the „X-shaped" configuration, formed by extending both belts crosswise over the upper part of the body, has, in general, the following drawbacks in the event of an accident:

D1. Exemplified in US 6,375,270 B1, all four belt portions of the outboard and inboard belts are retracted to different lengths and blocked by their respective belt retractors within milliseconds in an accident.

D2. Under the load of the same belt force in a front collision the deformation of the seat backrest, wherein both belt ends are fastened, is larger, thus increasing the forward motion. Furthermore, it is impossible to attach a vibration-dampening energy absorber because all four belt ends are occupied.



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D3. Exemplified in US 5,411,319, the belt user has to depress two release buttons to release the respective main latch plates 9 from the main buckle assemblies. This two-click operation causes discomfort and hinders rescue work. See countermeasures by means of a single master release button, mentioned below.

A one-piece seat belt 1 (Fig. 1) ref. to DE-OS 28 13 888 is equipped with two belt retractors (not drawn), fastened to both belt ends in the seat backrest, and a belt deflector 17, anchored to the seat-cushion frame 3.3 of the mid-portion of rear seat. The feature, proposed for a child, has the following drawbacks: